Background Document
Maryland Square PCE Site

Introduction

This background paper provides a summary of the discovery and subsequent investigation of a release of perchloroethylene, or PCE, believed to have originated from the former site of an Al Phillips the Cleaners in the Maryland Square Shopping Center at 3661 S. Maryland Parkway (just north of the intersection of S. Maryland Parkway and Twain Avenue) in Las Vegas. PCE is a solvent/degreaser commonly used by dry cleaners to clean clothes. It is also found in other household products.

Investigations of such contaminant releases in Nevada are performed by professional consultants certified as Environmental Managers by the Nevada Division of Environmental Protection (NDEP). The consultants are hired by the party responsible for the release. The NDEP is the state regulatory agency that oversees and directs the investigation and cleanup of such releases.

Discovery of the Release and the Subsequent Investigation

This PCE discharge at the site of the dry cleaner was first reported on November 29, 2000 via the NDEP's spill reporting hotline. The release was discovered during a routine environmental site assessment performed as part of a property transaction. The NDEP received the initial environmental report on July 21, 2001. After reviewing the report, the NDEP determined that the levels of PCE did not pose an immediate health concern at the site, but that more investigation was required to determine whether the PCE had migrated off site.

The dry cleaner operated at the Maryland Square site from 1969 through 2000. The exact date when the release began is not known. Data collected during the early stages of the investigation indicate that the PCE discharged by the dry cleaner leached into the soil and subsequently migrated into the shallow groundwater under the site of the former dry cleaner. Continuing investigation showed that the PCE contamination had migrated off site, forming what is called a "plume" in the groundwater.

To determine the nature and extent of a release to groundwater, investigators must rely upon laboratory chemical analysis of groundwater samples collected from water monitoring wells drilled at carefully selected locations. Investigation of a contaminant plume is a particularly difficult and time-consuming process, because the contamination is underground and not visible to the naked eye. Establishing the outside boundaries of a plume is a methodical step-by-step process that includes installation of a series of monitoring wells and analysis of the groundwater samples to determine if the contaminant is present in the wells and, if so, at what levels.

In November 2002, the NDEP received a monitoring report indicating that the PCE groundwater plume had **not** migrated to the southeast from the site toward Flamingo Wash, as initially suspected. However, the NDEP's review of the report suggested that additional wells were needed directly to the east of the Maryland Square Shopping Center and onto the Boulevard Mall property to find out if the PCE plume had migrated directly east of the dry cleaners. Accordingly, the NDEP requested that additional monitoring wells be installed. These wells

found the PCE plume had traveled due east, but these additional wells installed in 2003 and 2004 still failed to find the easternmost boundary of the plume.

A July 2005 report described the installation of six additional monitoring wells and gave the first indications that the PCE plume had extended under the residential neighborhood. In April 2006, two more wells were installed further to the east on Seneca Lane near Spencer Street and at Ottawa Circle. Information from those investigations indicated the PCE groundwater plume had indeed migrated to the east, under the Boulevard Mall and the residential area, toward the Las Vegas National Golf Course. Re-sampling of the wells in **February, April and July 2006** confirmed the finding that the PCE plume extended under the neighborhood.

In September 2006, responsibility for the case was transferred to the NDEP's headquarters in Carson City so greater staff resources could be devoted to the case.

Investigation Activities Since September, 2006

Since September, 2006, the following actions have occurred:

10/3/06	NDEP staff met with the Health, Safety and Environment Director for a potentially responsible party, DCI Group Management Ltd. (DCI is the parent company of Al Phillips the Cleaners), in the Las Vegas office of NDEP.
10/9/06	The NDEP sent a letter directing DCI to (1) conduct soil vapor sampling in the neighborhood to the east of Boulevard Mall, (2) prepare a detailed investigation and plan for removal of the contaminant at the dry cleaner site, (3) prepare a groundwater corrective action plan, and (4) perform further characterization of off-site groundwater contamination.
12/12/06	A meeting was held with DCI's CEO in the NDEP's Carson City offices to discuss the status of work. During that meeting, DCI agreed to: • Complete an investigation and recommendations for soil cleanup at the source • Conduct soil gas sampling in the neighborhood as required by the NDEP
2/23/07	NDEP received the soil assessment report on the 17 soil borings at the drycleaner site and recommendations for cleanup of the source area.
3/19/07	A total of 32 soil gas samples were collected from 16 locations along Spencer Street and on the east side of the Mall property. NDEP personnel and contractors performed field oversight and collected duplicate soil vapor samples at selected locations.
4/16/07	The soil gas report was submitted to the NDEP. Computer simulations of the soil gas data by NDEP staff indicated the potential for vapor intrusion into homes in the area. The model results also indicated that there was no

	immediate health threat to residents; however, the model output suggested that indoor air concentrations of PCE in some of the overlying homes could be above EPA's health-protective level for long-term exposure (30 years or more).
4/26/07	A meeting was held between the NDEP and DCI management in the NDEP's Carson City offices to discuss work status. Following the meeting, the NDEP sent a letter to DCI requesting their financial statements and other information. The NDEP stated its intent to move forward with investigation and mitigation, expending state funds as necessary and its intent to seek reimbursement of all costs from DCI and other potentially responsible parties.
5/1/07	The NDEP sent a letter to DCI officially notifying them that the NDEP may expend State funds and pursue reimbursement of costs.
5/17/07	NDEP managers meet with Southern Nevada Health District (SNHD) to provide a full briefing of the site investigation and the plan for public notification.
6/19/07	The NDEP sent a letter to the potentially responsible parties providing "Notice of NDEP intent" to use its contingency account for hazardous materials to address the area affected by spill and require performance of additional site assessment work and corrective action.
8/15/07	NDEP managers and staff met with potentially responsible parties in Las Vegas to discuss requirements for remediation and additional characterization of the Maryland Square PCE plume.
8/17/07	NDEP managers and staff met with and briefed representatives from the Clark County School District, including the school superintendent and principals from schools near the affected neighborhood.
8/20/07	NDEP managers met with and briefed the County Commissioner and other political representatives.
8/27/07	The NDEP mailed public notification letters to residents and property owners.
9/10/07 to 9/29/07	NDEP staff met with residents at their homes for personal meetings to answer questions, provide information, and obtain permission to sample the indoor air at the residence.
9/24/07 to 10/22/07	NDEP contractors collected samples of indoor air from homes with permission of the residents.

Oct, 2007	Four additional borings were drilled in the neighborhood. Groundwater samples were collected from all four borings, and three were completed as monitoring wells.
Oct-Nov, 2007	Samples of indoor air were analyzed at the laboratory, and data compiled in a database, and were validated and verified before residents were notified of the results.
Nov 2007	NDEP managers meet with Southern Nevada Health District (SNHD) to provide a full briefing of results of the site investigation and the plan for public notification.
11/27/07	The Monitoring Well Installation Report documenting the results of installation and sampling of four additional borings drilled in October, 2007
11/28/07	The NDEP sent sample results to each resident whose home was sampled during September and October, 2007.
December 2007	NDEP representatives met with individual homeowners to discuss their sample results and answer resident's questions
February 2008	The NDEP sent out additional notification letters to residents to (1) offer indoor air sampling to residents who did not respond to the initial offer of sampling and (2) to offer indoor air sampling to additional homes north of the original notification area to define the northern boundary of the plume.

The NDEP will (1) evaluate individual homes through a program of indoor air sampling, (2) recommend mitigation measures if concentrations exceed the action level for residential indoor air, (3) assist residents with the mitigation system for their homes where such a system is recommended, and (4) require that the responsible party/parties clean up the groundwater before it enters the neighborhood.

Once a mitigation system is installed and operating at a home, levels of PCE vapors coming from the groundwater and entering the home air are expected to decrease to below protective levels within 2 days.

After a groundwater treatment system is in place, levels of PCE in groundwater beneath the neighborhood will begin to decrease. Concentrations will continue to decrease gradually over time as clean groundwater enters the area and flushes out the contaminated groundwater. This process could take 5 to 10 years to clean up the groundwater under the neighborhood. Concentrations of the vapors should also decrease during this time. Continued monitoring will be conducted to determine when PCE concentrations reach acceptably low levels.